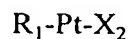


1     **WE CLAIM:**

2     1.     A liposomal antitumor composition, comprising a platinum complex having the  
3     formula



7             entrapped in a liposome, where  $R_1$  is diaminocycloalkyl and X is halogen.  
8

9     2.     The composition of claim 1, where  $R_1$  has from about 3 to about 6 carbon atoms.  
10

11    3.     The composition of claim 1, where  $R_1$  is 1,2-diaminocyclohexane.  
12

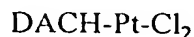
13    4.     The composition of claim 1, where X is chlorine.  
14

15    5.     The composition of claim 1, where the liposome comprises an acidic  
16    phospholipid.  
17

18    6.     The composition of claim 1, where the liposome comprises dimyristoyl  
19    phosphatidyl glycerol.  
20

21    7.     The composition of claim 1, where the platinum complex is intercalated between  
22    bilayers of the liposome.  
23

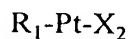
24    8.     A liposomal antitumor composition, comprising a platinum complex having the  
25    formula



29             intercalated between bilayers of a liposome, where DACH is  
30             diaminocyclohexane; and

1 where the liposome further comprises dimyristoyl phosphatidyl glycerol.

- 2
- 3 9. A method of inhibiting tumor growth, comprising:
- 4 administering to a mammal a composition that comprises a amount effective to
- 5 inhibit tumor growth of a platinum complex having the formula
- 6



9 entrapped in a liposome, where  $R_1$  is diaminocycloalkyl and X is halogen.

10

- 11 10. The method of claim 9, where  $R_1$  has from about 3 to about 6 carbon atoms.
- 12

- 13 11. The method of claim 9, where  $R_1$  is 1,2-diaminocyclohexane.
- 14

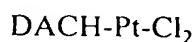
- 15 12. The method of claim 9, where X is chlorine.
- 16

- 17 13. The method of claim 9, where the liposome comprises an acidic phospholipid.
- 18

- 19 14. The method of claim 9, where the liposome comprises dimyristoyl phosphatidyl
- 20 glycerol.
- 21

- 22 15. The method of claim 9, where the complex is intercalated between bilayers of the
- 23 liposome.
- 24

- 25 16. A method of inhibiting tumor growth, comprising:
- 26 administering to a mammal a composition that comprises a amount effective to
- 27 inhibit tumor growth of a platinum complex having the formula
- 28



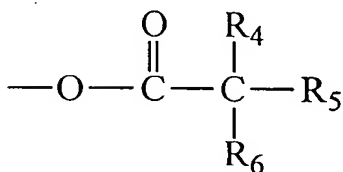
intercalated between bilayers of a liposome, where DACH is diaminocyclohexane, and where the liposome further comprises dimyristoyl phosphatidyl glycerol.

17. A method of preparing an antitumor composition, comprising:

adjusting the pH of a composition that comprises a platinum complex having the formula



entrapped in a liposome, where  $\text{R}_1$  is diaminocycloalkyl, and  $\text{R}_2$  and  $\text{R}_3$  each have the formula



where  $\text{R}_4$ ,  $\text{R}_5$ , and  $\text{R}_6$  are each independently hydrocarbon moieties having from 1 to about 10 carbon atoms,

whereby the complex (I) is converted into a complex having the formula



where  $\text{R}_1$  is diaminocycloalkyl and X is halogen.

1 18. The method of claim 17, where the pH is adjusted to between about 2 and about  
2 6.5.

3  
4 19. The method of claim 17, where  $R_4$ ,  $R_5$ , and  $R_6$  are each independently alkyl  
5 having from 1 to about 6 carbon atoms.

6  
7 20. The method of claim 17, where  $R_4$ ,  $R_5$ , and  $R_6$  are each independently alkyl  
8 having from 1 to about 3 carbon atoms.

9  
10 21. The method of claim 17, where the complex (I) is converted to the complex (II)  
11 within the liposome.

12  
13 22. The method of claim 17, where the pH is adjusted by contacting the liposome  
14 with an acidic solution.

15  
16 23. The method of claim 17, where the pH is adjusted by including an acidic  
17 phospholipid in the liposome.

18  
19 24. The method of claim 17, where the liposome comprises dimyristoyl phosphatidyl  
20 glycerol.

21  
22 25. The method of claim 17, where  $R_2$  and  $R_3$  are neodecanoato.

23  
24 26. The method of claim 17, where  $R_1$  has from about 3 to about 6 carbon atoms.

25  
26 27. The method of claim 17, where  $R_1$  is 1,2-diaminocyclohexane.

27  
28 28. The method of claim 17, where X is chlorine.

1 29. The method of claim 17, where the complex (I) is intercalated between bilayers of  
2 the liposome.

3  
4 30. The method of claim 17, where the complex (II) is intercalated between bilayers  
5 of the liposome.

6  
7 31. The method of claim 17, where the complex (I) is cis-bis-neodecanoato-  
8 trans-R,R-1,2-diaminocyclohexane platinum(II).

9  
10 32. The method of claim 17, further comprising the step of subsequently readjusting  
11 the pH after a predetermined time to about 7.

12  
13 33. A method of preparing an antitumor composition, comprising:  
14 adjusting the pH of a composition that comprises cis-bis-neodecanoato-  
15 trans-R,R-1,2-diaminocyclohexane platinum (II) entrapped in a liposome,  
16 to a level less than 7, whereby the platinum complex is converted into  
17 dichlorodiamine platinum (II), and  
18 after a predetermined time, adjusting the pH to at least about 7.

19  
20 34. A method of delivering a biologically active chemical moiety internally to a  
21 mammal, comprising:

22 providing an aqueous formulation of a prodrug of a biologically active moiety, the  
23 prodrug being entrapped in a liposome, the prodrug further being capable  
24 of forming the biologically active moiety upon exposure to a solution  
25 having an acidic pH;

26 reducing the pH to an acidic level, thereby converting the prodrug to the  
27 biologically active compound; and

28 administering the aqueous formulation to a mammal.  
29

1 35. The method of claim 34, where the biologically active moiety is an antitumor  
2 agent.

3

4 36. The method of claim 34, where the pH is reduced by including an acidic  
5 phospholipid in the liposome.

6